



THE SOUTH CAROLINA
DEPARTMENT of ADMINISTRATION

SAFETY PROGRAM:

EYE AND FACE PROTECTION

11/1/98

Revisions: Updates in ANSI Z89.1-2009 & 2014; 12/1/14 - increase in reimbursement for prescription safety eyewear for cost up to \$125 out of pocket employee expense

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PURPOSE

The purpose of this policy is to set forth requirements to provide eye and face protection for employees of the South Carolina Department of Administration for use while performing work where eye or face protection is required by OSHA regulations (Title 29 of the Code of Federal Regulations, Subpart I – Personal Protective Equipment, Part Number 1910 General Industry, Standard 1910.133 Eye and Face Protection; and 29CFR 1926 Construction Industry, 1926.102).

POLICY

Anyone working in or passing through areas that pose eye hazards are to wear protective eyewear. Each affected employee shall use appropriate face and/or eye protection whenever there is a risk of injury to the eyes due to impact, heat, chemicals, dust or optical radiation hazards (see Attachment 1 – Eye Hazard Assessment). Eye and face protection, as personal protective equipment, is considered a last means of protecting an employee from on-the-job eye and face hazards. Engineering and administrative controls should always be considered first. However, in many cases, safety glasses, goggles and/or face shields are the only means of protection, or may be necessary in combination with other controls.

- “Employee” is defined as any full-time probationary, full-time permanent, time-limited or contracted employee working for and/or under the supervision of Department of Administration personnel. Affected Department of Administration teams include but are not limited to the following: Facilities Management - Building Maintenance, Building Systems, Environmental/Energy, Custodial, State House Maintenance, Horticulture, Statewide Building Services, Construction and Planning; Business Operations – Parking, Safety; and State Fleet Management - Maintenance.
- Visitors to Department of Administration operations that may be exposed to eye or face hazards must also be provided and wear appropriate eye or face protection, which may be loaner or disposable safety eyewear.
- Contractors, working on projects in facilities belonging to the Department of Administration and/or under their jurisdiction, who need eye or face (or any other type of personal) protection, are to be provided such protection by their company.

PROCEDURES

1. **Safety Eyewear Requirements:** Safety eyewear (safety glasses, goggles, visors, face shields, welding helmets) used to protect the eyes and face shall comply with the American National Standards Institute (ANSI) Z 87.1 - 2010 "American National Standards Practice for Occupation and Educational Eye and Face Protection," or later edition. Safety eyewear shall be distinctly marked with the manufacturer's name and other identification as required by ANSI Z 87.1. Protective eyewear is available as Non-Impact, Impact, Splash/Mist, Dust and Optical Radiation protectors.

A. **Non-Impact Rated Protection (Z87):** Lenses rated for Basic Impact Protection may be used in a work environment where the known or presumed hazards are of a low velocity, low mass and low impact nature. Such lenses will be designated with "Z87" and can not be relied upon for protection from high impact exposures.

B. **Impact Rated Protection (Z87+):** Lenses rated for High Impact Protection may be used in a work environment where the known or presumed hazards are of a high velocity, high mass and high impact nature (i.e., working with nail guns, powder-actuated tools, grinders, power saws, etc.). Safety eyewear marked as impact protectors must pass all high-impact testing criteria and will be designated with "Z87" and a plus sign (Z87+).



instead of



Z87+ - D4 (Impact / Dust) Safety Glasses

NOTE 1: Traditional lenses made of hardened safety glass are only one-tenth as impact resistant as polycarbonate lenses. Glass and composite plastic lenses do not meet the high velocity, high mass and/or high impact requirements.

C. **Splash or Droplet Protection (D3):** Eyewear that protects against splashes or droplets will have a "D3" engraved on the frame.

D. **Dust Protection (D4 or D5):** Eyewear that protects against dust will have "D4" engraved on the frame or a "D5" for a fine dust protector.

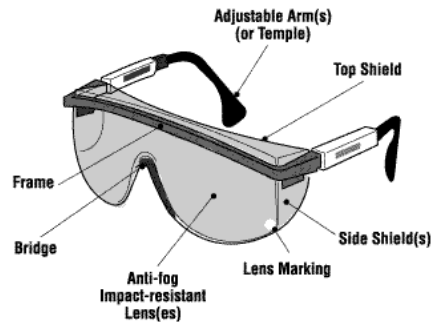
E. **Optical Radiation (W, U, R or L):** Protective lenses will be marked according to a scale or shade marking (clear, welding, UV filter, visible light filter and IR filter):

Welding Filters	W and Shade number, i.e. W10
Ultra-violet (UV) Filters	U and Scale number, i.e. U6
Infra-red (Heat) Filters	R and Scale number, i.e. R4
Visible Light (Glare) Filters	L and Scale number, i.e. L2.5

Example: The marking XXZ87+U6D3D4 indicates a (XX = Manufacturer's Name) impact rated goggle that provides superior UV filtration and protection against splash and dust hazards

F. **Side Protection:** Protective eyewear shall have side protection (from the front to some distance between the front and the ear) to guard eyes from lateral hazards such as flying objects and particles.

NOTE 2: Safety glasses shall be equipped with side shields that are an integral part of the frame or lens (i.e., wrap around glasses), or permanently attached to the frame (i.e., flat fold glasses). Though detachable side protectors (i.e., clip-on or slide-on side shields) are acceptable by OSHA, due to the frequency and types of exposures, the Department of Administration only allows permanently installed side shields.



Typical Safety Glasses
Glasses



Wrap-Around Style Safety
Glasses

2. **Face Shields** are designed to protect portions of the face from certain hazards. Face shields shall be worn in combination with other eye protection, i.e., safety glasses or goggles where there are potential multiple hazards to the face and eyes.



Face Shield with Safety Glasses



Safety Goggles

3. **Goggles** may be worn instead of safety glasses. However, in specific work environments, goggles must be worn instead of safety glasses. The proper protective goggles must be selected for the work process from the following descriptions:
- Open Vent goggles - provide impact protection only
 - Indirect Vented goggles - provide chemical splash protection
 - Non-Vented goggles - provide protection from gases, mists and fumes

NOTE 3: Older style safety glasses provided little to no protection from dust, chemical splashes, gases, mists or fumes. Safety goggles or new safety glasses rated as D4 or D5 are required in dusty work environments or rated as D3 for work with chemicals.

NOTE 4: One may refer to a product's container label or its material safety data sheet (MSDS) to determine what type of face and/or eye protection is required.

4. **Prescription Safety Eyewear:** Each employee who wears prescription eyewear shall wear eye protection while performing work that involves hazards to the eyes. This eye protection shall incorporate the prescription in its design or that can be worn over prescription lenses without disrupting either the prescription eyewear or the protective eyewear. The job process and frequency shall determine the type of eye protection used. Using the procedures at Attachment 2, the employee obtains their supervisor's prior approval then may select their vendor of choice to purchase their prescription safety eyewear. The employee's prescription for eyewear must be written within the last twenty-four (24) months. If the prescription safety eyewear meets the requirements of this policy, the supervisor can authorize reimbursement to the employee. Department of Administration will pay up to \$125.00 for an employee's out of pocket expense, including taxes, or the purchase price of the prescription safety glasses, whichever is less. This cost is in addition to and does not include the eye examination to determine the employee's eyewear prescription, which may be provided under other employee health insurance benefits. Regular eye examinations at least every two years are recommended in order to protect your eye health and to assure that any vision problems are properly diagnosed, treated, or corrected.

NOTE 5: Contact lenses are not protective eyewear. Those who wear contact lenses shall also wear appropriate eye protection in hazardous environments. Contact lenses are not recommended to be worn in dusty or chemical work environments.

NOTE 6: Lenses in prescription glasses may be referred to as "safety glass." However, these lenses do not meet the requirements for workplace safety unless marked, "ANSI Z 87.1 – 2010" or higher, and attaching side shields to regular prescription glasses does not meet OSHA or ANSI Z87.1 requirements. Polycarbonate is the only lens material currently available that meets the ANSI Z 87.1-2010 standard for High Impact Protectors.

NOTE 7: Repair or replacement of prescription safety glasses is at the discretion of the Team Leader. Normally replacement is not based upon time but rather is based upon individual situations such as the employee receiving a significantly new prescription or damage.

NOTE 8: A less expensive alternative to prescription safety eyewear is bifocal safety reading glasses with set standard strengths, i.e., +1.0, +2.0, +3.0. Contact the Facilities Management Equipment Shop.

5. **Welding Eye Protection:** Eye and face protection for welding shall be in accordance with OSHA regulation 29 CFR 1910.133 Personal Protective Equipment, paragraph (a)(5), and 1910.252 Welding, Cutting, and Brazing, paragraph (5)(b). The regulations require a minimum protective shade depending upon the specific type of welding operation (i.e., soldering, brazing, arc welding, oxygen cutting, etc.). Reference the Department of Administration Welding (Hot Work) Program.

NOTE 9: Do not confuse the terms "tint" and "shade," which are not interchangeable. Tinted eye protection is designed to offer minimal (low level) protection against visible light and ultraviolet radiation, i.e., sun glasses. Filter shades designed for welding operations offer a much higher degree of protection. Welding lenses shall be marked W followed by shade number. Example: W3 is for a spectacle welding lens with a shade 3.0 welding filter.

6. **LASER Eye Protection:** Lasers are categorized into hazard Classes 1, 1a, 2, 3a, 3b and 4. (29 CFR 1926.54 and ANSI Z136.1 by reference; see Attachment 4)

- a. **CLASS I:** A Class I laser is considered safe as it must be designed to not emit radiation at any known hazard levels and are not to be a fire hazard. Users of Class I laser products are not required to use radiation hazard controls during operation or maintenance. (Maintenance is defined as those tasks specified in the user instructions for assuring the performance of the product and may include items such as routine cleaning. Service functions, which are beyond maintenance, include opening protective housings surrounding higher-powered laser sources that may require hazard controls.) Although Class I laser product labels do not have to indicate class, they must be labeled with other performance requirements.

WARNING: Many laser eye accidents occur during alignment. The procedures require extreme caution. Always avoid direct exposure on the eye by a beam of laser light, no matter how low the power. Persons unnecessary to the laser operation should be kept away.

b. **CLASS II – IV:**

i. Because of its brightness, the visible beam from a Class II low-powered laser light will be too dazzling to stare into for extended periods. Momentary viewing is not considered hazardous. Intentional extended viewing, however, like for alignment, is considered hazardous.

ii. Class II through Class IV laser products must have appropriate Caution or Danger labels on the product.

iii. Class IIIa intermediate, Class IIIb moderate and Class IV high-powered lasers require control measures, for example controlled access areas with entry warning signs, laser eyewear protection, and/or engineering controls such as protective barriers or curtains to prevent biological damage to the eyes and skin burns. All laser eyewear shall be clearly labeled with Optical Density values and wavelengths for which protection is afforded.



Rotary Laser Level
(Class IIIa Intermediate Power)



Laser Warning Label / Sign



Laser Eye Protection

7. **Emergency Eyewash/Shower Units** are designed to deliver water to rinse contaminants from a user's eyes, face or body. As such, they are a form of first aid equipment to be used in the event of an accident. However, they are not a substitute for primary protective devices (including eye and face protection and protective clothing) or for safe procedures for handling hazardous materials. The first 10 to 15 seconds after exposure to a hazardous substance, especially a corrosive substance, are critical. Delaying treatment, even for a few seconds, may cause serious injury. In accordance with OSHA regulation 29 CFR 1910.151 and ANSI Z 358.1-2009 (or the latest edition), where the eyes or body may be exposed (i.e., where mixed, handled, or stored) to injurious corrosive chemicals or contaminants, suitable facilities for the quick drenching or flushing of the eyes or body (i.e., eye washes, drench hoses, body showers, etc.) shall be provided within the work area for immediate emergency use. These units must be on the same level in a straight path with no obstructions and within 10 seconds walking distance (no more than approximately 55 feet). The water should be delivered lukewarm (60-100°F). Emergency eyewash, shower and drench units should be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available, and to clear the supply line of sediments and minimize microbial contamination. Drench Shower and Eye Wash combination units must be tested simultaneously to ensure they can fully flush both the skin, eyes, and face at the same time. They are also to be inspected annually. There is to be written documentation of these weekly checks and annual inspections (preferably at the emergency station).



Emergency Eyewash
(Rinse Eyes)



Emergency Shower
(Full-Body Rinse)



Emergency Drench Hose
(Spot Rinse)

NOTE 10: It may be necessary to install anti-scalding devices (temperature control valve or thermostatic tempering valve to include outdoor locations that are exposed to direct sunlight), constant flow meters, and other devices that will help maintain a constant temperature (60-100°F) and flow rate. Where the possibility of freezing conditions exists, equipment shall be protected from freezing.

NOTE 11: The ANSI standard defines "flushing fluid" as any of potable (drinking) water, preserved water, preserved buffered saline solution or other medically acceptable solutions. Portable and self-contained systems are acceptable only if they meet the quantity and pressure requirements, i.e., eyewash stations should be designed to deliver fluid to both eyes simultaneously for a minimum of 15 minutes at a volume of not less than 1.5 liters (0.4 gallons) per minute but so as not to injure the eyes. Eyewash bottles and portable units typically do not meet these minimums; however, if used for the purpose of immediate flushing, the user should proceed to a self-contained or plumbed eyewash

and flush for the minimum 15 minutes. Additionally, personal, portable or self-contained eyewash units require frequent replacement of the buffered saline solution. In order to control bacterial growth that can cause serious eye infections, it is important to monitor the shelf life of the solution and replace the solution when it has expired.



Personal Eyewash (Bottle)



Portable Eyewash



Self-Contained Eyewash

NOTE 12: Work areas and operations that may require these devices include battery charging areas, laboratories, spraying operations, high dust areas, dipping operations, and hazardous substances dispensing areas.

8. **Maintenance:** Eye and face protection must be properly cleaned, stored and maintained in order to remain effective.
 - Avoid rough handling that can scratch or damage lenses. Store your safety glasses in a clean, dry place where they cannot fall or be stepped on. Keep them in a case when they are not being worn.
 - Clean your safety eyewear frequently following the manufacturer's instructions. Despite anti-fog coatings, atmospheric conditions and restricted ventilation of the protector can cause lenses to fog and impair vision. Frequent cleaning may be necessary.
 - Report damaged eye protection to your supervisor. Replace scratched, pitted, broken, bent or ill-fitting glasses. Damaged glasses impair vision and can weaken lenses.
9. **Signs** should be posted in areas requiring eye and/or face protection where eye hazards routinely exist. The signs may be posted on entry doors or near areas where the hazard(s) exist. Unit locations are to be identified with highly visible signs. Examples of areas requiring eye protection include shops (wood, machine), construction sites, and chemical laboratories. Signs shall be in accordance to OSHA 1910.145, and shall be yellow with black letters. The sign shall read, "CAUTION, Eye Protection Required" (icon / symbol, optional).

[illegible]

A. Each new employee shall receive training that includes the following information:

- When eye protection is necessary;
- What type of eye protection is required;
- The possible injuries that can occur as the result of failure to wear the provided eye protection;
- How to properly put on, take off, adjust, and wear the eye protection;
- The limitation of the eye protection; and,
- The proper care, storage, maintenance, useful life and disposal of the eye protection.

B. Remedial or refresher training shall be provided when:

- The employee demonstrates a lack of knowledge;
- Different eye protection is provided to the employee;
- Periodically as deemed necessary by supervision and/or Safety Committee.

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Attachment 1

EYE HAZARD ASSESSMENT

HAZARD	EXAMPLES	COMMON TASKS	PROTECTION
Impact	Flying objects such as large chips, fragments, particles, sand, and dirt	Chipping, grinding, machining, masonry work, wood working, sawing, drilling, chiseling, powered fastening, riveting, and sanding	<ul style="list-style-type: none"> • Safety glasses with side protection • Goggles • Face Shield (over glasses or goggles)
Heat	Anything emitting extreme heat, molten metal or sparks	Furnace operations, pouring, casting, hot dipping, and welding	<ul style="list-style-type: none"> • Safety glasses with side protection • Goggles • Reflective Face Shield (over glasses or goggles)
Chemicals	Splash, fumes, vapors, and irritating mists	Acid and chemical handling, degreasing, plating, and working with blood	<ul style="list-style-type: none"> • Chemical Goggles • Face Shield (over Chemical Goggles for severe cases)
Dust	Harmful Dust	Woodworking, buffing, and general dusty conditions	<ul style="list-style-type: none"> • Goggles
Optical Radiation	Radiant energy, glare, and intense light	Welding, torch-cutting, brazing, soldering, and laser work	<ul style="list-style-type: none"> • Welding Helmet, Goggles or Shield (Lens Shade depends on Type of Welding)
Glare	Sunlight	Working Outside in Daylight	<ul style="list-style-type: none"> • Tinted lenses

NOTE: Multiple and simultaneous exposure to a variety of hazards may require multiple types of protection. Example: Operations involving heat may also involve optical radiation. Protection from both hazards must be provided.

**Prescription Safety Glasses
Employee Purchase Request & Supervisor Approval for Reimbursement**

The Employee:

1. Must obtain prior authorization from the Team Leader (or designated representative) for prescription safety eyewear in order to be reimbursed.
2. Must already have a prescription for eyewear written within the last two years, or the prescription may be obtained concurrently with the order of prescription safety eyewear.
3. May select their vendor of choice.
4. Must select prescription safety eyewear that meets ANSI Z 87.1-2010 or higher standards. Unless otherwise authorized by the Team Leader, the prescription safety glasses must have:
 - a. Lenses rated for Impact Protectors (Z87+)
 - b. Permanently installed side shields
5. Is responsible for payment of your prescription safety eyewear.
6. Is entitled to submit a request through their Team Leader for reimbursement of up to \$125.00 for an employee's out of pocket expense, including taxes, or the purchase price of the prescription safety glasses, whichever is less. NOTE: The cost for prescription safety eyewear is in addition to and does not include the eye examination. Sales receipt must be attached to approval for reimbursement.

The Team Leader (or designated representative):

1. Must inform the employee with prescription eyewear of the need to wear safety eyewear protection when there is an eye/face hazard. This information must include the type(s) of safety eyewear protection for the specific hazard(s) for that employee's work environment(s).
2. Should inform the employee with prescription eyewear of available options for eye protection and let the employee select either:
 - a. Safety glasses or goggles that fit over the employee's personal prescription glasses.
 - b. Non-prescription safety glasses (available in standard reading strengths, i.e., +1.0, +2.0, +3.0)
 - c. Prescription safety glasses or inserts
3. Must authorize in order for an employee to obtain and be reimbursed for prescription safety eyewear (not including eye exam) of up to \$125.00 for an employee's out of pocket expense, including taxes, or the purchase price of the prescription safety glasses, whichever is less.
NOTE: Authorize repair or replacement based upon individual situations such as damage or the employee receiving a significantly new prescription.
4. Must ensure the prescription safety eyewear meets ANSI Z 87.1-2010 or higher standards before authorizing employee reimbursement.
 - a. Lenses are rated for Impact Protection (Z87+) required in a work environment with hazards of a high velocity, high mass and/or high impact, i.e., working with nail guns, powder-actuated tools, grinders, power saws, etc.
 - b. Detachable side protectors (i.e., clip-on or slide-on side shields) are not allowed; only permanently installed side shields are allowed.

The Eyewear Vendor is to:

1. Ensure the employee seeking prescription safety eyewear has a prescription written within the last two years. Otherwise, require a current eye exam.
2. Assist the employee in making a selection to include beneficial options (tint, bi-/tri-focal, protective scratch/fog-resistant coatings, etc.) and proper fittings.
3. Ensure the prescription safety eyewear meets ANSI Z 87.1-2010 or higher standards. Unless otherwise requested by the employee, the prescription safety glasses must have:
 - a. Lenses rated for Impact Protectors (Z87+)
 - b. Permanently installed side shields.
4. Explain proper eyewear cleaning, maintenance and storage to the employee.
5. Explain to the employee the repair and replacement policy and for how long the warranty services are effective.
6. Provide the employee a warranty and receipt.

Employee Name _____ Date _____

Team _____ Job Title _____

Eyewear Prescription Date _____ (not older than 2 years)

REQUEST FOR PURCHASE – Supervisor Approval: Employee instructed on above purchase process and employee authorized to purchase safety prescription eyewear at vendor of choice

Job requires: ☐ Non-Impact (Z87) ☐ IMPACT (Z87+; Polycarbonate)

☐ Splash or Droplet Protection (D3) ☐ Optical Radiation

☐ Dust Protection (D4) ☐ Fine Dust Protection (D5)

Team Leader _____ Date _____

(signature = approval)

REQUEST FOR REIMBURSEMENT – Supervisor Approval: Prescription safety eyewear inspected and meets ANSI Z 87.1-2010 or higher standards and other requirements as stated above

Total Cost of Safety Glasses: _____ (attach sales receipt)

Out of Pocket Reimbursement Amount (Maximum to include taxes): \$125.00

Team Leader _____ Date _____

(Submit Authorization for Reimbursement to Team's Business Manager)

EMERGENCY EYE WASH, SHOWER AND DRENCH HOSE EQUIPMENT INSPECTION

Emergency eye wash, shower and/or drench hose units are required by OSHA regulation (29 CFR 1910.151(c)) in areas where employees can come into contact with hazardous materials that could harm eyes or skin. Reference ANSI Standard ANSI Z358.1-2009 (or later) for proper installation, operation and inspection of emergency eye wash and shower units.

1. Installed in a well-lit area within ten seconds or 55 feet from and on the same plane as the hazard with no obstructions or trip hazards
Note: One door may be permitted to separate potential users from emergency fixtures. However, the door cannot have a lock and it must open toward the shower or eyewash.
2. Insure Emergency Eyewash/Shower/Drench Hose signage is in close vicinity to the equipment and is highly visible from all directions
3. Protect equipment against freezing
Note: A freeze (and/or Scald) Protection Valve should drain away from the system to prevent a slip hazard
4. Eyewash outlet heads (lids covering where water flows from) should be kept covered when not in use
5. Inspect annually
6. Activate plumbed units weekly long enough to ensure operation and to clear rust, sediment and microbes from the supply line (runs clear)
 - a. Insure the water flow “pops” off the eyewash protection caps and the two streams cross but is not too much that could cause eye damage (eyewash – 0.4 GPM; drench shower – 30 GPM at 30 PSI)
 - b. Combination eyewash and shower units are to be activated simultaneously
 - c. Insure the water is tepid (use temperature gauge to measure 60-100⁰ F).
 - d. Valve should easily activate in a second or less and remain open on its own until it is intentionally turned offNote: Flow switch alarms are recommended to prevent false activations and save the facility from water damage
7. If there is any spill, mop dry the floor to prevent a slip hazard
8. Document activations and inspections by placing employee’s initials and date on the inspection tag/log
 - o NOTE: If inspection fails, notify Facilities Management, 734-3308, for (work order) repair; replace any broken or missing parts immediately

Ref: <http://www.bradleycorp.com/products/techdata/4002.pdf> &
http://www.bradleycorp.com/products/instruction/4055_EFX_Quick-Compliance-Guide-Booklet.pdf

CONTROLS FOR USE OF LASERS

Excerpt from: TABLE III: 6-9 ENGINEERING CONTROL MEASURES FOR THE FOUR
LASER CLASSES [ANSI Z136.1-2007 or later]

CONTROL MEASURE	I	I-A	II	III-A	III-B	IV
Temporary laser controlled area (shall, if embedded Class IIIB or Class IV laser)	X	X	X	X		
Labels		X	X	X	X	X
Area posting			R	R	X	X
Administrative & procedural controls (Standard Operating Procedures)		X	X	X	X	X
Education and training				X	X	X
Authorized personnel					X	X
Eye protection					R	X
Alignment procedures			X	X	X	X

X – Shall / Must / Required

R – Recommended / May

Laser Controlled Area: Any locale where the activities of those within are subject to control and supervision for the purpose of laser radiation hazard protection.

Additional Information from the OSHA Technical Manual, Section III, Chapter 6 – Laser Hazards (http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_6.html):

1. Class IIIB and Class IV lasers: Skin covers and or sun-screen creams are recommended. For the hands, gloves will provide some protection against laser radiation. Tightly woven fabrics and opaque gloves provide the best protection. A laboratory jacket or coat can provide protection for the arms.
2. Class IV lasers: It is recommended to wear uniforms made of flame-resistant materials.
3. Under normal operation, Optical Fiber (Light Wave) Communication (OFC) Systems are completely enclosed (Class I) with the optical fiber and optical connectors forming the enclosure. During installation or servicing, or when an accidental break in the cable occurs, the system can no longer be considered enclosed. Engineering controls should limit the accessible emission to safe levels. Only authorized trained personnel shall be permitted to perform service on OFC systems.